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ABSTRACT

Fourth-grade students (45 black and 45 white) were assigned to one of three groups defined by degree of teacher use of nonstandard English (standard English, moderate nonstandard English, or high nonstandard English). Each group was presented a lesson involving computing areas of rectangles and right triangles. After the lesson, each group was tested on comprehension of the concepts. The standard English group achieved significantly higher than the moderate nonstandard English group, as did the high nonstandard English group. The white students achieved significantly higher than the black students. (Author/MK)

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Nonstandard English and Student Achievement in Mathematics

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Abstract

Fourth grade students(45 black and 45 white) were assigned to one of three groups defined by degrees of teacher use of nonstandard English(standard English vs. moderate nonstandard English vs. high nonstandard English). Each group was presented a lesson concerning mathematical concepts. After the lesson, each group was tested on comprehension of the concepts. The standard English group achieved significantly higher than the moderate nonstandard English group, as did the high nonstandard English group. The white students achieved significantly higher than the black students.

Dialect differences have been cited as one of the major barriers to academic comprehension and achievement among culturally disadvantaged black children(U.S. Commission on Civil Rights(14); Baratz(1); Jensen(9); Bereiter and Englemann(3); Hess and Shipman(8); Duetsch(5);and Bernstein(2)). Such studies implied that the language habits acquired by the culturally disadvantaged child inhibit the development of conceptual learning and abstraction. The presence of a communication gap between the teacher and the culturally disadvantaged black child was emphasized. In particular, Baratz(1) noted that black children performed significantly better than white children when presented with nonstandard English stimuli. Baratz found that black children repeated the black nonstandard English forms more accurately while white children were more accurate with standard English sentences. However, such results may only indicate the ability to reproduce dialectic forms and may not be generalizable to the ability to comprehend the sentences.

Several studies have supported the idea that culturally disadvantaged black children not only can comprehend standard English but can also perform better in response to standard English forms. For example, Copple and Suci(4) found that lower-income black children performed better in response to standard English items than to the black nonstandard dialect. They found no indication of interference in comprehension due to a dialect difference. In a study by Levy(10) black children had better comprehension of stories

presented in standard English than in black nonstandard English. Eisenberg, Berlin, Dill, and Sheldon(6) found that black children obtained higher listening scores for monosyllabic words when the words were pronounced by white speakers than by black speakers. When Quay(11,12) administered the Stanford-Binet to black Head Start children in both standard and nonstandard dialects, the children scored slightly, but nonsignificantly, higher when the test was presented in standard English form. In another study by Quay(13), lower-income black children were found to be competent in comprehending standard English. In fact, they decoded more effectively when material was presented in standard English forms than when it was presented in nonstandard English forms. Gussett(7) designed a nonstandard English course of study in mathematics for children and found no significant differences in achievement of black children taught in the nonstandard English course and black children taught in a standard English course.

The present study attempted to investigate aspects of dialect differences which had not previously been investigated. (1) What effect would a teacher using nonstandard English have on the student achievement level of black children? Of white children? (2) Do black and white children differ significantly in their ability to comprehend nonstandard English?

METHOD

The 45 black and 45 white 8 and 9 year old students in the fourth grade were selected from four elementary schools in the

Richmond County(Augus , Georgia) school district. The majority of the students belonged to the lower middle or upper lower income groups.

The Comprehensive Tests of Basic Skills(CTBS) in mathematics were used to establish equivalency for the experimental groups. Students were selected so that the CTBS grade-equivalent mean score for each of the experimental groups was 3.4, approximately six months below grade level. The CTBS mathematics scores were also used to match pairs of black and white children within each of the experimental groups. That is, within each experimental group, each black student was matched with a corresponding white student so that a difference of no more than 0.3 points existed in the CTBS mathematics scores of the two students.

Black students were randomly assigned to one of three treatments. One treatment(high nonstandard English) involved a lesson presentation in which high degrees of redundant phrases, misplaced clauses, double negatives, improper forms of "to be", improper addition and deletion of "s" to verbs and nouns, and other forms of nonstandard English were used by the teacher. A second treatment(moderate nonstandard English) involved a presentation in which a "moderate" degree of nonstandard English was used by the teacher. A third treatment (standard English) involved a presentation in which the teacher verbal patterns contained no nonstandard English. The frequency of occurrence of grammatical errors in the high nonstandard English group was 18.7 errors per minute of teacher discourse; the moderate

nonstandard English group contained 9.4 errors per minute. White students were assigned to one of the three treatments, with the previously stated provision that each black student in each experimental group was matched with a corresponding white student.

The lesson presentations were exactly the same, except for the degrees with which nonstandard English was used. The same content was covered in the same sequence of presentation. The lessons involved computing areas of rectangles and right triangles. None of the students had been presented this content in class prior to the experiment.

In order to control for extraneous variables, each of the three lessons was tape-recorded from scripts and the students listened to the tape-recording while observing overhead projections of corresponding content. The same person showed the same overhead projections for each lesson. The audiotape and overhead transparencies gave detailed descriptions of how to find the areas of rectangles and right triangles and gave the solution for each example presented. As previously stated, each of the three lessons was the same, except for the frequency of nonstandard English usage.

Table 1 shows the terms and their frequency of occurrence in the high nonstandard English and moderate nonstandard English lessons. The following paragraphs are excerpts from the standard English, moderate nonstandard English, and high nonstandard English lessons respectively. The occurrences of nonstandard English are italicized.

Standard English: "Let's try some other examples. In Figure A we multiply 4 inches by 5 inches, just as we would when we find the

area of a rectangle. But then when we get the answer of 20 square inches we must remember to divide by 2."

Moderate nonstandard English:"Let's us tries some other examples. In Figure A we multiply 4 inches times 5 inches, just as we would when we find the area of a rectangle. But when we gets then the answer of 20 square inches we must remember to divide by 2."

High nonstandard English:"Let's us tries some other examples. In Figure A we multiplies 4 inches time 5 inches, just as what we be doing to finds the area of a rectangle. But when we gets then the answer of 20 square inches we must remember by 2 to divide."

Insert Table 1 about here

Students were administered a 27-item test immediately after each lesson was completed. The test measured the capability of the student to identify concepts and apply mathematical generalizations to problems focused on in the lesson presentation.

RESULTS

A 2(black students vs. white students) x 3(standard English vs. moderate nonstandard English vs. high nonstandard English) analysis of variance was performed on student posttest scores. The main effect due to verbal fluency was significant $F(2,84)=5.42, p < .01$, as was the main effect due to race $F(1,84)=8.90, p < .01$. There was no interaction between fluency and race. The mean achievement scores for the six experimental conditions are presented in Table 2. Table 3 presents the results of the analysis.

Insert Table 2 about here

Insert Table 3 about here

The Tukey(a) tests showed a significant difference($p < .01$) in favor of the standard English treatment over the moderate nonstandard English treatment. No significant differences were found between the standard English treatment and the high nonstandard English treatment or between the moderate nonstandard English treatment and the high nonstandard English treatment. The Tukey(a) tests also revealed significant differences($p < .01$) in favor of the white standard English group over the black moderate nonstandard English group and in favor of the white high nonstandard English group over the black moderate nonstandard English group. Significant differences($p < .05$) were found in favor of the white moderate nonstandard English group over the black moderate nonstandard English group and in favor of the black high nonstandard English group over the black moderate nonstandard English group.

DISCUSSION

Caution must be exercised in interpreting the results of this study. No attempts were made to validate the nonstandard English lessons as approximating ordinary dialectic forms. Interpretations should not go beyond the fact that the moderate and high nonstandard English lessons contained nonstandard English. In the light of this

caution, the following observations are made.

Both black and white students were most negatively affected by a moderate frequency of nonstandard English usage. It seems that the moderate nonstandard English lesson more closely approximates what one would anticipate to be the classroom discourse of a teacher employing nonstandard English. It is conjectured that the students in the high nonstandard English treatment may have dismissed the audio portion of the lesson as being too extreme and concentrated more on the overhead projections that accompanied the lesson. Since the overhead projections paralleled the audio portion of the lesson, this may explain the discrepancy between scores of the high nonstandard English group and of the moderate nonstandard English group.

The differences between the three treatments for the white children were nonsignificant, which seems to indicate that white children have little difficulty comprehending different forms of nonstandard English. The black children performed significantly better with the standard English that with the nonstandard English.

The study also suggests that visual materials alone may not induce student achievement if the teacher uses a particular frequency of nonstandard English. Lesson presentations containing the nonstandard English format may significantly reduce the achievement level of the students, despite the inclusion of visual materials and despite the degree to which the teacher has organized and prepared the lesson. Perhaps the single most relevant suggestion for teacher education is that educators should focus on manageable verbal skills that can be observed, quantified, and objectively critiqued by supervisors.

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Table 1.- Grammatical Errors and the Frequency of Occurrence

	Occurrences in High Nonstandard English Lessons	Occurrences in Moderate Nonstandard English Lessons
Redundant phrases(e.g.,let's us, this here)	17	8
Substitute "what" for "that"	16	8
Substitute "them" for "these"	3	2
Verb substitution(e.g.,"is" for "are")	30	15
Adding "s" to verb	94	45
Deleting "s" from verb	22	11
Double negative	4	2
Misplaced clauses	45	23
Improper form of "be"	55	27
"Cause" for "because"	5	3
Adding "s" to noun	9	5
Past tense of verb for present	2	1
Improper use of "done"	11	5
"A" for "an"	1	1
"Ain't"	1	1
"Us" for "ourselves"	2	1
"You" for "your"	2	1
Total	319	159

Table 2.-CTBS Means and Posttest Means for Groups

		Standard English	Moderate Nonstandard English	High Nonstandard English
Black Students (n=15 per group)	CTBS Mean	3.43	3.42	3.43
	Posttest Mean	15.80	10.93	14.87
White Students (n=15 per group)	CTBS Mean	3.43	3.42	3.45
	Posttest Mean	17.60	15.27	17.27

Table 3.-Results of the Analysis

Source	df	SS	MS	F
Verbal Fluency (A)	2	221.622	110.811	5.42*
Race (B)	1	182.045	182.045	8.90*
A X B	2	26.29	13.144	0.64
Error	84	1718.53	20.46	

*Significant at the .01 level.